

SEQUENCE LISTING

<110> CHUGAI RESEARCH INSTITUTE FOR MOLECULAR MEDICINE, INC.

<120> Tumor suppressor gene

<130> C1-104PCT

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<150> JP 1999-118806

<151> 1999-04-26

<160> 15

<170> PatentIn Ver. 2.0

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<211> 2829

<212> DNA

<213> Homo sapiens

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<221> CDS

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Met Ala

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gta cgc gcg ttg aag ctg ctg acc aca ctg ctg gct gtc gtg gcc gct 105

Val Arg Ala Leu Lys Leu Leu Thr Thr Leu Leu Ala Val Val Ala Ala

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gcc tcc caa gcc gag gtc gag tcc gag gca gga tgg ggc atg gtg acg 153

Ala Ser Gln Ala Glu Val Glu Ser Glu Ala Gly Trp Gly Met Val Thr

20

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cct gat ctg ctc ttc gcc gag ggg acc gca gcc tac gcg cgc ggg gac 201

Pro Asp Leu Leu Phe Ala Glu Gly Thr Ala Ala Tyr Ala Arg Gly Asp

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tgg ccc ggg gtg gtc ctg agc atg gaa cgg gcg ctg cgc tcc cgg gca 249

Trp Pro Gly Val Val Leu Ser Met Glu Arg Ala Leu Arg Ser Arg Ala

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gcc ctc cgc gcc ctt cgc ctg cgc tgc cgc acc cag tgt gcc gcc gac 297

Ala Leu Arg Ala Leu Arg Leu Arg Cys Arg Thr Gln Cys Ala Ala Asp

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Met Gln Gln Asn Leu Asp Tyr Tyr Gln Thr Met Ser Gly Val Lys Glu

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Ala Asp Phe Lys Asp Leu Glu Thr Gln Pro His Met Gln Glu Phe Arg			
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Leu Gly Val Arg Leu Tyr Ser Glu Glu Gln Pro Gln Glu Ala Val Pro			
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His Leu Glu Ala Ala Leu Gln Glu Tyr Phe Val Ala Tyr Glu Glu Cys			
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Arg Ala Leu Cys Glu Gly Pro Tyr Asp Tyr Asp Gly Tyr Asn Tyr Leu			
	245	250	255
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Glu Tyr Asn Ala Asp Leu Phe Gln Ala Ile Thr Asp His Tyr Ile Gln			
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Val Leu Asn Cys Lys Gln Asn Cys Val Thr Glu Leu Ala Ser His Pro			
275	280	285	290

Ser Arg Glu Lys Pro Phe Glu Asp Phe Leu Pro Ser His Tyr Asn Tyr

305

Leu Gln Phe Ala Tyr Tyr Asn Ile Gly Asn Tyr Thr Gln Ala Gly Glu

320

Cys Ala Lys Thr Tyr Leu Leu Phe Phe Pro Asn Asp Glu Val Met Asn

335

Gln Asn Leu Ala Tyr Tyr Ala Ala Met Leu Gly Glu Glu His Thr Arg

350

Ser Ile Gly Pro Arg Glu Gln Gly Thr

360

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<212> PRT

<213> Homo sapiens

<400> 2

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Ala Ala Ala Ser Gln Ala Glu Val Glu Ser Glu Ala Gly Trp Gly Met

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Val Thr Pro Asp Leu Leu Phe Ala Glu Gly Thr Ala Ala Tyr Ala Arg

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Gly Asp Trp Pro Gly Val Val Leu Ser Met Glu Arg Ala Leu Arg Ser

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Arg Ala Ala Leu Arg Ala Leu Arg Leu Arg Cys Arg Thr Gln Cys Ala

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Ala Asp Phe Pro Trp Glu Leu Asp Pro Asp Trp Ser Pro Ser Pro Ala

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95

Gln Ala Ser Gly Ala Gly Ala Leu Arg Asp Leu Ser Phe Phe Gly Gly

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Leu Leu Arg Arg Ala Ala Cys Leu Arg Arg Cys Leu Gly Pro Pro Ala

115

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Ala His Ser Leu Ser Glu Glu Met Glu Leu Glu Phe Arg Lys Arg Ser

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Pro Tyr Asn Tyr Leu Gln Val Ala Tyr Phe Lys Ile Asn Lys Leu Glu

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Lys Ala Val Ala Ala Ala His Thr Phe Phe Val Gly Asn Pro Glu His

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Met Glu Met Gln Gln Asn Leu Asp Tyr Tyr Gln Thr Met Ser Gly Val

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Lys Glu Ala Asp Phe Lys Asp Leu Glu Thr Gln Pro His Met Gln Glu

195

200

205

Phe Arg Leu Gly Val Arg Leu Tyr Ser Glu Glu Gln Pro Gln Glu Ala

210

215

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Val Pro His Leu Glu Ala Ala Leu Gln Glu Tyr Phe Val Ala Tyr Glu

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Glu Cys Arg Ala Leu Cys Glu Gly Pro Tyr Asp Tyr Asp Gly Tyr Asn

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<212> DNA

<213> Homo sapiens

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<222> (52)..(2259)

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Val Arg Ala Leu Lys Leu Leu Thr Thr Leu Leu Ala Val Val Ala Ala

5

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gcc tcc caa gcc gag gtc gag tcc gag gca gga tgg ggc atg gtg acg 153

Ala Ser Gln Ala Glu Val Glu Ser Glu Ala Gly Trp Gly Met Val Thr

20

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30

cct gat ctg ctc ttc gcc gag ggg acc gca gcc tac gcg cgc ggg gac 201

Pro Asp Leu Leu Phe Ala Glu Gly Thr Ala Ala Tyr Ala Arg Gly Asp

35

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50

tgg ccc ggg gtg gtc ctg agc atg gaa cgg gcg ctg cgc tcc cgg gca 249

Trp Pro Gly Val Val Leu Ser Met Glu Arg Ala Leu Arg Ser Arg Ala

55

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gcc ctc cgc gcc ctt cgc ctg cgc tgc cgc acc cag tgt gcc gcc gac 297

Ala Leu Arg Ala Leu Arg Leu Arg Cys Arg Thr Gln Cys Ala Ala Asp

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ttc ccg tgg gag ctg gac ccc gac tgg tcc ccc agc ccg gcc cag gcc 345

Phe Pro Trp Glu Leu Asp Pro Asp Trp Ser Pro Ser Pro Ala Gln Ala

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tcg ggc gcc ggc gcc ctg cgc gac ctg agc ttc ttc ggg ggc ctt ctg 393

Ser Gly Ala Gly Ala Leu Arg Asp Leu Ser Phe Phe Gly Gly Leu Leu

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cgt cgc gct gcc tgc ctg cgc cgc tgc ctc ggg ccg ccg gcc gcc cac 441

Arg Arg Ala Ala Cys Leu Arg Arg Cys Leu Gly Pro Pro Ala Ala His

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tcg ctc agc gaa gag atg gag ctg gag ttc cgc aag cgg agc ccc tac 489

Ser Leu Ser Glu Glu Met Glu Leu Glu Phe Arg Lys Arg Ser Pro Tyr

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aac tac ctg cag gtc gcc tac ttc aag atc aac aag ttg gag aaa gct 537

Asn Tyr Leu Gln Val Ala Tyr Phe Lys Ile Asn Lys Leu Glu Lys Ala

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gtt gct gca gca cac acc ttc ttc gtg ggc aat cct gag cac atg gaa 585

Val Ala Ala Ala His Thr Phe Phe Val Gly Asn Pro Glu His Met Glu

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atg cag cag aac cta gac tat tac caa acc atg tct gga gtg aag gag 633

Met Gln Gln Asn Leu Asp Tyr Tyr Gln Thr Met Ser Gly Val Lys Glu

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gcc gac ttc aag gat ctt gag act caa ccc cat atg caa gaa ttt cga 681

Ala Asp Phe Lys Asp Leu Glu Thr Gln Pro His Met Gln Glu Phe Arg

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ctg gga gtg cga ctc tac tca gag gaa cag cca cag gaa gct gtg ccc 729

Leu Gly Val Arg Leu Tyr Ser Glu Glu Gln Pro Gln Glu Ala Val Pro

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cac cta gag gcg gcg ctg caa gaa tac ttt gtg gcc tat gag gag tgc 777

His Leu Glu Ala Ala Leu Gln Glu Tyr Phe Val Ala Tyr Glu Glu Cys

230

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cgt gcc ctc tgc gaa ggg ccc tat gac tac gat ggc tac aac tac ctt 825

Arg Ala Leu Cys Glu Gly Pro Tyr Asp Tyr Asp Gly Tyr Asn Tyr Leu

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gag tac aac gct gac ctc ttc cag gcc atc aca gat cat tac atc cag 873

Glu Tyr Asn Ala Asp Leu Phe Gln Ala Ile Thr Asp His Tyr Ile Gln

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295 300 305

310 315 320

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355 360 365 370

ctg gaa aaa gaa ctg ctt ttc ttc gct tat gat gtt ttt gga att ccc 1209

Leu Glu Lys Glu Leu Leu Phe Phe Ala Tyr Asp Val Phe Gly Ile Pro

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ttt gtg gat ccg gat tca tgg act cca gaa gaa gtg att ccc aag aga 1257

Phe Val Asp Pro Asp Ser Trp Thr Pro Glu Glu Val Ile Pro Lys Arg

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ttg caa gag aaa cag aag tca gaa cgg gaa aca gcc gta cgc atc tcc 1305

Leu Gln Glu Lys Gln Lys Ser Glu Arg Glu Thr Ala Val Arg Ile Ser

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cag gag att ggg aac ctt atg aag gaa atc gag acc ctt gtg gaa gag 1353

Gln Glu Ile Gly Asn Leu Met Lys Glu Ile Glu Thr Leu Val Glu Glu

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aag acc aag gag tca ctg gat gtg agc aga ctg acc cgg gaa ggt ggc 1401

Lys Thr Lys Glu Ser Leu Asp Val Ser Arg Leu Thr Arg Glu Gly Gly

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ccc ctg ctg tat gaa ggc atc agt ctc acc atg aac tcc aaa ctc ctg 1449

Pro Leu Leu Tyr Glu Gly Ile Ser Leu Thr Met Asn Ser Lys Leu Leu

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aat ggt tac cag cgg gtg gtg atg gac ggc gta atc tct gac cac gag 1497

Asn Gly Tyr Gln Arg Val Val Met Asp Gly Val Ile Ser Asp His Glu

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Cys Gln Glu Leu Gln Arg Leu Thr Asn Val Ala Ala Thr Ser Gly Asp

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ggc tac cgg ggt cag acc tcc cca cat act ccc aat gaa aag ttc tat 1593

Gly Tyr Arg Gly Gln Thr Ser Pro His Thr Pro Asn Glu Lys Phe Tyr

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ggc gtc act gtc ttc aaa gcc ctc aag ctg ggg caa gaa ggc aaa gtt 1641

Gly Val Thr Val Phe Lys Ala Leu Lys Leu Gly Gln Glu Gly Lys Val

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cct ctg cag agt gcc cac ctg tac tac aac gtg acg gag aaa gtg cgg 1689

Pro Leu Gln Ser Ala His Leu Tyr Tyr Asn Val Thr Glu Lys Val Arg

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cgc atc atg gag tcc tac ttc cgc ctg gat acg ccc ctc tac ttt tcc 1737

Arg Ile Met Glu Ser Tyr Phe Arg Leu Asp Thr Pro Leu Tyr Phe Ser

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tac tct cat ctg gtg tgc cgc act gcc atc gaa gag gtc cag gca gag 1785

Tyr Ser His Leu Val Cys Arg Thr Ala Ile Glu Glu Val Gln Ala Glu

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10045343064

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Ala Glu Thr Leu Val Cys Val Lys Glu Pro Pro Ala Tyr Thr Phe Arg

595

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Asp Tyr Ser Ala Ile Leu Tyr Leu Asn Gly Asp Phe Asp Gly Gly Asn

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Phe Tyr Phe Thr Glu Leu Asp Ala Lys Thr Val Thr Ala Glu Val Gln

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Pro Gln Cys Gly Arg Ala Val Gly Phe Ser Ser Gly Thr Glu Asn Pro

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cat gga gtg aag gct gtc acc agg ggg cag cgc tgt gcc atc gcc ctg 2073

His Gly Val Lys Ala Val Thr Arg Gly Gln Arg Cys Ala Ile Ala Leu

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Trp Phe Thr Leu Asp Pro Arg His Ser Glu Arg Asp Arg Val Gln Ala

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10045815 10045815

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Asp Asp Leu Val Lys Met Leu Phe Ser Pro Glu Glu Met Asp Leu Ser

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Gln Glu Gln Pro Leu Asp Ala Gln Gln Gly Pro Pro Glu Pro Ala Gln

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gag tct ctc tca ggc agt gaa tcg aag ccc aag gat gag cta 2259

Glu Ser Leu Ser Gly Ser Glu Ser Lys Pro Lys Asp Glu Leu

725

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<212> PRT

<213> Homo sapiens

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Val Thr Pro Asp Leu Leu Phe Ala Glu Gly Thr Ala Ala Tyr Ala Arg

35 40 45

Gly Asp Trp Pro Gly Val Val Leu Ser Met Glu Arg Ala Leu Arg Ser

50 55 60

Arg Ala Ala Leu Arg Ala Leu Arg Leu Arg Cys Arg Thr Gln Cys Ala

65 70 75 80

Ala Asp Phe Pro Trp Glu Leu Asp Pro Asp Trp Ser Pro Ser Pro Ala

85 90 95

Gln Ala Ser Gly Ala Gly Ala Leu Arg Asp Leu Ser Phe Phe Gly Gly

100 105 110

Leu Leu Arg Arg Ala Ala Cys Leu Arg Arg Cys Leu Gly Pro Pro Ala

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120

125

Ala His Ser Leu Ser Glu Glu Met Glu Leu Glu Phe Arg Lys Arg Ser

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Pro Tyr Asn Tyr Leu Gln Val Ala Tyr Phe Lys Ile Asn Lys Leu Glu

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Lys Ala Val Ala Ala Ala His Thr Phe Phe Val Gly Asn Pro Glu His

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Met Glu Met Gln Gln Asn Leu Asp Tyr Tyr Gln Thr Met Ser Gly Val

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Lys Glu Ala Asp Phe Lys Asp Leu Glu Thr Gln Pro His Met Gln Glu

195

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Phe Arg Leu Gly Val Arg Leu Tyr Ser Glu Glu Gln Pro Gln Glu Ala

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Val Pro His Leu Glu Ala Ala Leu Gln Glu Tyr Phe Val Ala Tyr Glu

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Glu Cys Arg Ala Leu Cys Glu Gly Pro Tyr Asp Tyr Asp Gly Tyr Asn

10040815-10004

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Phe Tyr Gly Val Thr Val Phe Lys Ala Leu Lys Leu Gly Gln Glu Gly
515 520 525

Lys Val Pro Leu Gln Ser Ala His Leu Tyr Tyr Asn Val Thr Glu Lys

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Val Arg Arg Ile Met Glu Ser Tyr Phe Arg Leu Asp Thr Pro Leu Tyr

545

550

555

560

Phe Ser Tyr Ser His Leu Val Cys Arg Thr Ala Ile Glu Glu Val Gln

565

570

575

Ala Glu Arg Lys Asp Asp Ser His Pro Val His Val Asp Asn Cys Ile

580

585

590

Leu Asn Ala Glu Thr Leu Val Cys Val Lys Glu Pro Pro Ala Tyr Thr

595

600

605

Phe Arg Asp Tyr Ser Ala Ile Leu Tyr Leu Asn Gly Asp Phe Asp Gly

610

615

620

Gly Asn Phe Tyr Phe Thr Glu Leu Asp Ala Lys Thr Val Thr Ala Glu

625

630

635

640

Val Gln Pro Gln Cys Gly Arg Ala Val Gly Phe Ser Ser Gly Thr Glu

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650

655

Asn Pro His Gly Val Lys Ala Val Thr Arg Gly Gln Arg Cys Ala Ile

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665

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Ala Leu Trp Phe Thr Leu Asp Pro Arg His Ser Glu Arg Asp Arg Val

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Gln Ala Asp Asp Leu Val Lys Met Leu Phe Ser Pro Glu Glu Met Asp

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Leu Ser Gln Glu Gln Pro Leu Asp Ala Gln Gln Gly Pro Pro Glu Pro

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Ala Gln Glu Ser Leu Ser Gly Ser Glu Ser Lys Pro Lys Asp Glu Leu

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<213> Mus musculus

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 Gly Arg Arg Arg Arg Arg Leu Thr Gly Cys Gly Glu Ser Glu Pro Gly
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 Tyr Ser Arg Arg Asp Trp Pro Gly Val Val Leu Asn Met Glu Arg Ala
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Leu Arg Ser Arg Ala Ala Leu Arg Ala Leu Arg Leu Arg Cys Arg Thr
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cgc tgt gcc acc gaa ctg ccg tgg gca ccg gac ctg gat ctc ggt ccg 290
 Arg Cys Ala Thr Glu Leu Pro Trp Ala Pro Asp Leu Asp Leu Gly Pro
 80 85 90

gac ccc agc ctg agc cag gac ccg ggc gcc gcc gcc ctg cac gac ctg 338
Asp Pro Ser Leu Ser Gln Asp Pro Gly Ala Ala Ala Leu His Asp Leu
95 100 105

110 115 120 125

130 135 140

145 150 155

160 165 170

175 180 185

190 195 200 205

ccc cat atg cat gag ttt cgg ctg ggg gta cga ctc tac tca gag gag 674

Pro His Met His Glu Phe Arg Leu Gly Val Arg Leu Tyr Ser Glu Glu

210

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aag cca cag gaa gct gtg ccc cac ctg gag gcg gca ctg caa gag tac 722

Lys Pro Gln Glu Ala Val Pro His Leu Glu Ala Ala Leu Gln Glu Tyr

225

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235

ttt gtg gcc gat gag gag tgc cgt gcc ctc tgc gaa ggg ccc tat gac 770

Phe Val Ala Asp Glu Glu Cys Arg Ala Leu Cys Glu Gly Pro Tyr Asp

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Tyr Asp Gly Tyr Asn Tyr Leu Asp Tyr Ser Ala Asp Leu Phe Gln Ala

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atc aca gat cat tac gtc cag gtc ctc aac tgt aag cag aac tgt gtc 866

Ile Thr Asp His Tyr Val Gln Val Leu Asn Cys Lys Gln Asn Cys Val

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acg gag ctg gct tcc cac cca agt agg gaa aag ccc ttt gaa gac ttc 914

Thr Glu Leu Ala Ser His Pro Ser Arg Glu Lys Pro Phe Glu Asp Phe

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ctc cct tca cac tat aat tac cta cag ttt gcc tac tac aac att ggg 962

Leu Pro Ser His Tyr Asn Tyr Leu Gln Phe Ala Tyr Tyr Asn Ile Gly

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10045843 10045843

aac tat aca caa gct att gaa tgt gcc aag acc tac ctc ctc ttc ttt 1010

Asn Tyr Thr Gln Ala Ile Glu Cys Ala Lys Thr Tyr Leu Leu Phe Phe

320

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330

ccc aat gat gag gtg atg cac cag aat ctg gct tat tac aca gcc atg 1058

Pro Asn Asp Glu Val Met His Gln Asn Leu Ala Tyr Tyr Thr Ala Met

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ctt gga gaa gaa gag gcc agc tcc atc agc ccc agg gag aat gcc gag 1106

Leu Gly Glu Glu Glu Ala Ser Ser Ile Ser Pro Arg Glu Asn Ala Glu

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gaa tac cga cgt cca aac ctg ttg gag aaa gaa ctg ctt ttc ttc gct 1154

Glu Tyr Arg Arg Pro Asn Leu Leu Glu Lys Glu Leu Leu Phe Phe Ala

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tat gac att ttt gga att ccc ttt gtg gat ccc gat tca tgg act cca 1202

Tyr Asp Ile Phe Gly Ile Pro Phe Val Asp Pro Asp Ser Trp Thr Pro

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gaa gaa gtg att ccc aag aga ttg caa gag aaa cag aag tct gaa cgg 1250

Glu Glu Val Ile Pro Lys Arg Leu Gln Glu Lys Gln Lys Ser Glu Arg

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gaa aca gcc gta cgc atc tcc cag gag att ggg aac ctt atg aag gaa 1298

10045815-10001

Glu Thr Ala Val Arg Ile Ser Gln Glu Ile Gly Asn Leu Met Lys Glu

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atc gag acc ctt gtg gaa gag aag acc aag gag tct ctg gat gtg agc 1346

Ile Glu Thr Leu Val Glu Glu Lys Thr Lys Glu Ser Leu Asp Val Ser

430

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aga ctg acc cgg gaa ggt ggt ccc ctg ctg tat gaa ggc atc agt ctc 1394

Arg Leu Thr Arg Glu Gly Gly Pro Leu Leu Tyr Glu Gly Ile Ser Leu

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acc atg aac tcc aaa gtc ttg aat ggc tcc cag cgg gtg gtg atg gat 1442

Thr Met Asn Ser Lys Val Leu Asn Gly Ser Gln Arg Val Val Met Asp

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ggt gtg atc tct gat gat gag tgc cag gag ctg cag aga ctg acc aat 1490

Gly Val Ile Ser Asp Asp Glu Cys Gln Glu Leu Gln Arg Leu Thr Asn

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485

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gcg gca gca act tcg gga gat ggc tac cga ggt cag acc tcc cca cac 1538

Ala Ala Ala Thr Ser Gly Asp Gly Tyr Arg Gly Gln Thr Ser Pro His

495

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acc cca aat gaa aag ttc tat ggt gtt act gtc ctc aaa gct ctc aag 1586

Thr Pro Asn Glu Lys Phe Tyr Gly Val Thr Val Leu Lys Ala Leu Lys

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10045815 100604

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620

ggc gac ttc gat gga gga aac ttt tac ttc aca gaa cta gat gcc aag 1922

625 630 - 635

Thr Val Thr Ala Glu Val Gln Pro Gln Cys Gly Arg Ala Val Gly Phe

Ser Ser Gly Thr Glu Asn Pro His Gly Val Lys Ala Val Thr Arg Gly

Gln Arg Cys Ala Ile Ala Leu Trp Phe Thr Leu Asp Pro Arg His Ser

Glu Arg Asp Arg Val Gln Ala Asp Asp Leu Val Lys Met Leu Phe Ser

Pro Glu Glu Val Asp Leu Pro Gln Glu Gln Pro Leu Pro Asp Gln Gln

Gly Ser Pro Glu Pro Gly Glu Glu Phe Leu His Gly Ala Thr Val Leu

720 725 730

gga gtg ggc ata gca gga cac act ctt ctc tgg gct tgg ctg 2252

Gly Val Gly Ile Ala Gly His Thr Leu Leu Trp Ala Trp Leu

735

740

745

taggctcaga atgcaggccc agaaccaccc tggggcctat gtaggcagct gccgtcagca 2312

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Met Ala Val Thr Lys Gly Gly Cys Trp His Asp Ala Ser Gly Arg Arg

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Arg Arg Arg Leu Thr Gly Cys Gly Glu Ser Glu Pro Gly Trp Asp Val

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Ala Ala Pro Asp Leu Leu Tyr Ala Glu Gly Thr Ala Ala Tyr Ser Arg

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50 55 60

65 70 75 80

85 90 95

100 105 110

115 120 125

130 135 140

145 150 155 160

165 170 175

Glu His Met Glu Met Arg Gln Asn Leu Asp Tyr Tyr Gln Thr Met Ser

180

185

190

Gly Val Lys Glu Ala Asp Phe Arg Asp Leu Glu Ala Lys Pro His Met

195

200

205

His Glu Phe Arg Leu Gly Val Arg Leu Tyr Ser Glu Glu Lys Pro Gln

210

215

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Glu Ala Val Pro His Leu Glu Ala Ala Leu Gln Glu Tyr Phe Val Ala

225

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Asp Glu Glu Cys Arg Ala Leu Cys Glu Gly Pro Tyr Asp Tyr Asp Gly

245

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255

Tyr Asn Tyr Leu Asp Tyr Ser Ala Asp Leu Phe Gln Ala Ile Thr Asp

260

265

270

His Tyr Val Gln Val Leu Asn Cys Lys Gln Asn Cys Val Thr Glu Leu

275

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285

Ala Ser His Pro Ser Arg Glu Lys Pro Phe Glu Asp Phe Leu Pro Ser

290

295

300

His Tyr Asn Tyr Leu Gln Phe Ala Tyr Tyr Asn Ile Gly Asn Tyr Thr

305

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315

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10045815-102601

325 330 - 335

340 345 350

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385 390 395 400

405 410 415

420 425 430

435 440 445

450 455 460

Ser Lys Val Leu Asn Gly Ser Gln Arg Val Val Met Asp Gly Val Ile
 465 470 475 480

Ser Asp Asp Glu Cys Gln Glu Leu Gln Arg Leu Thr Asn Ala Ala Ala
 485 490 495

Thr Ser Gly Asp Gly Tyr Arg Gly Gln Thr Ser Pro His Thr Pro Asn
 500 505 510

Glu Lys Phe Tyr Gly Val Thr Val Leu Lys Ala Leu Lys Leu Gly Gln
 515 520 525

Glu Gly Lys Val Pro Leu Gln Ser Ala Arg Met Tyr Tyr Asn Val Thr
 530 535 540

Glu Lys Val Arg Arg Val Met Glu Ser Tyr Phe Arg Leu Asp Thr Pro
 545 550 555 560

Leu Tyr Phe Ser Tyr Ser His Phe Val Cys Arg Thr Ala Ile Glu Glu
 565 570 575

Ser Gln Ala Glu Arg Lys Asp Ser Ser His Pro Val His Val Asp Asn
 580 585 590

Cys Ile Leu Asn Ala Glu Ala Phe Met Cys Ile Lys Glu Pro Pro Ala

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Tyr Thr Phe Arg Glu Tyr Ser Ala Ile Leu Tyr Leu Asn Gly Asp Phe

610

615

620

Asp Gly Gly Asn Phe Tyr Phe Thr Glu Leu Asp Ala Lys Thr Val Thr

625

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635

640

Ala Glu Val Gln Pro Gln Cys Gly Arg Ala Val Gly Phe Ser Ser Gly

645

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Thr Glu Asn Pro His Gly Val Lys Ala Val Thr Arg Gly Gln Arg Cys

660

665

670

Ala Ile Ala Leu Trp Phe Thr Leu Asp Pro Arg His Ser Glu Arg Asp

675

680

685

Arg Val Gln Ala Asp Asp Leu Val Lys Met Leu Phe Ser Pro Glu Glu

690

695

700

Val Asp Leu Pro Gln Glu Gln Pro Leu Pro Asp Gln Gln Gly Ser Pro

705

710

715

720

Glu Pro Gly Glu Glu Phe Leu His Gly Ala Thr Val Leu Gly Val Gly

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Ile Ala Gly His Thr Leu Leu Trp Ala Trp Leu

740

745

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<211> 2322

<212> DNA

<213> Mus musculus

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Met Ala Val Thr Lys Gly Gly Cys Trp His Asp Ala Ser

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ggt cgc cgc cgc cgc cgc ctt acg ggt tgc ggc gag tct gag ccg gga 98

Gly Arg Arg Arg Arg Arg Leu Thr Gly Cys Gly Glu Ser Glu Pro Gly

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tgg gac gtg gca gcc cct gac ctg ctt tac gca gag ggg acc gcg gcc 146

Trp Asp Val Ala Ala Pro Asp Leu Leu Tyr Ala Glu Gly Thr Ala Ala

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1004344001

Tyr Ser Arg Arg Asp Trp Pro Gly Val Val Leu Asn Met Glu Arg Ala

60

Leu Arg Ser Arg Ala Ala Leu Arg Ala Leu Arg Leu Arg Cys Arg Thr

75

Arg Cys Ala Thr Glu Leu Pro Trp Ala Pro Asp Leu Asp Leu Gly Pro

90

Asp Pro Ser Leu Ser Gln Asp Pro Gly Ala Ala Ala Leu His Asp Leu

105

Arg Phe Phe Gly Ala Val Leu Arg Arg Ala Ala Cys Leu Arg Arg Cys

125

Leu Gly Pro Pro Ser Ala His Leu Leu Ser Glu Glu Leu Asp Leu Glu

140

Phe Asn Lys Arg Ser Pro Tyr Asn Tyr Leu Gln Val Ala Tyr Phe Lys

145	150	155	
ata aac aag ctg gag aaa gct gtg gct gcg gca cac acc ttc ttt gtg 530			
Ile Asn Lys Leu Glu Lys Ala Val Ala Ala Ala His Thr Phe Phe Val			
160	165	170	
ggc aat cct gag cac atg gag atg cgg cag aac ctc gac tat tac caa 578			
Gly Asn Pro Glu His Met Glu Met Arg Gln Asn Leu Asp Tyr Tyr Gln			
175	180	185	
acc atg tct ggg gtg aag gag gca gac ttc agg gat ctc gag gcc aag 626			
Thr Met Ser Gly Val Lys Glu Ala Asp Phe Arg Asp Leu Glu Ala Lys			
190	195	200	205
ccc cat atg cat gag ttt cgg ctg ggg gta cga ctc tac tca gag gag 674			
Pro His Met His Glu Phe Arg Leu Gly Val Arg Leu Tyr Ser Glu Glu			
210	215	220	
aag cca cag gaa gct gtg ccc cac ctg gag gcg gca ctg caa gag tac 722			
Lys Pro Gln Glu Ala Val Pro His Leu Glu Ala Ala Leu Gln Glu Tyr			
225	230	235	
ttt gtg gcc gat gag gag tgc cgt gcc ctc tgc gaa ggg ccc tat gac 770			
Phe Val Ala Asp Glu Glu Cys Arg Ala Leu Cys Glu Gly Pro Tyr Asp			
240	245	250	

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tac gac ggc tac aac tac cta gac tac agc gct gac ctc ttc cag gcc 818
 Tyr Asp Gly Tyr Asn Tyr Leu Asp Tyr Ser Ala Asp Leu Phe Gln Ala
 255 260 265

atc aca gat cat tac gtc cag gtc ctc aac tgt aag cag aac tgt gtc 866
 Ile Thr Asp His Tyr Val Gln Val Leu Asn Cys Lys Gln Asn Cys Val
 270 275 280 285

acg gag ctg gct tcc cac cca agt agg gaa aag ccc ttt gaa gac ttc 914
 Thr Glu Leu Ala Ser His Pro Ser Arg Glu Lys Pro Phe Glu Asp Phe
 290 295 300

ctc cct tca cac tat aat tac cta cag ttt gcc tac tac aac att ggg 962
 Leu Pro Ser His Tyr Asn Tyr Leu Gln Phe Ala Tyr Tyr Asn Ile Gly
 305 310 315

aac tat aca caa gct att gaa tgt gcc aag acc tac ctc ctc ttc ttt 1010
 Asn Tyr Thr Gln Ala Ile Glu Cys Ala Lys Thr Tyr Leu Leu Phe Phe
 320 325 330

ccc aat gat gag gtg atg cac cag aat ctg gct tat tac aca gcc atg 1058
 Pro Asn Asp Glu Val Met His Gln Asn Leu Ala Tyr Tyr Thr Ala Met
 335 340 345

ctt gga gaa gaa gag gcc agc tcc atc agc ccc agg gag aat gcc gag 1106
 Leu Gly Glu Glu Glu Ala Ser Ser Ile Ser Pro Arg Glu Asn Ala Glu

350	355	360	365	
gaa tac cga cgt cca aac ctg ttg gag aaa gaa ctg ctt ttc ttc gct				1154
Glu Tyr Arg Arg Pro Asn Leu Leu Glu Lys Glu Leu Leu Phe Phe Ala				
	370	375	380	
tat gac att ttt gga att ccc ttt gtg gat ccc gat tca tgg act cca				1202
Tyr Asp Ile Phe Gly Ile Pro Phe Val Asp Pro Asp Ser Trp Thr Pro				
	385	390	395	
gaa gaa gtg att ccc aag aga ttg caa gag aaa cag aag tct gaa cgg				1250
Glu Glu Val Ile Pro Lys Arg Leu Gln Glu Lys Gln Lys Ser Glu Arg				
	400	405	410	
gaa aca gcc gta cgc atc tcc cag gag att ggg aac ctt atg aag gaa				1298
Glu Thr Ala Val Arg Ile Ser Gln Glu Ile Gly Asn Leu Met Lys Glu				
	415	420	425	
atc gag acc ctt gtg gaa gag aag acc aag gag tct ctg gat gtg agc				1346
Ile Glu Thr Leu Val Glu Glu Lys Thr Lys Glu Ser Leu Asp Val Ser				
	430	435	440	445
aga ctg acc cgg gaa ggt ggt ccc ctg ctg tat gaa ggc atc agt ctc				1394
Arg Leu Thr Arg Glu Gly Gly Pro Leu Leu Tyr Glu Gly Ile Ser Leu				
	450	455	460	

acc atg aac tcc aaa gtc ttg aat ggc tcc cag cgg gtg gtg atg gat 1442
 Thr Met Asn Ser Lys Val Leu Asn Gly Ser Gln Arg Val Val Met Asp

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ggt gtg atc tct gat gat gag tgc cag gag ctg cag aga ctg acc aat 1490
 Gly Val Ile Ser Asp Asp Glu Cys Gln Glu Leu Gln Arg Leu Thr Asn

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gcg gca gca act tcg gga gat ggc tac cga ggt cag acc tcc cca cac 1538
 Ala Ala Ala Thr Ser Gly Asp Gly Tyr Arg Gly Gln Thr Ser Pro His

495

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acc cca aat gaa aag ttc tat ggt gtt act gtc ctc aaa gct ctc aag 1586
 Thr Pro Asn Glu Lys Phe Tyr Gly Val Thr Val Leu Lys Ala Leu Lys

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ctc ggg cag gaa gga aaa gtt cct ctg cag agt gcc cgc acc gca ctg 1634
 Leu Gly Gln Glu Gly Lys Val Pro Leu Gln Ser Ala Arg Thr Ala Leu

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535

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caa tagaagagtc acaggctgag aggaaggaca gtagccaccc cgtccacgtg 1687
 Gln

gataactgca tcttgaatgc cgaagccttc atgtgtatca aggagccccc agcatacacg 1747

ttccgggaat acagcgccat cctttacctc aatggcgact tcgatggagg aaactttttac 1807

ttcacagaac tagatgccaa gactgtgacg gcagaggtgc agccccagtg tggaagggt 1867

gtgggattct cttctggcac tgagaacca catggagtga aggctgtcac cagggggcag 1927

cgctgcgcca tcgcccgtg gttcacgctg gatcctcggc acagtgagag agacagggtg 1987

caggcagatg acctggtgaa gatgctgttc agcccagaag aggtggacct cccccaggaa 2047

cagccccctgc ctgaccagca gggttcgcca gagcctggag aagagtttct gcatggtgct 2107

actgttcttg gagtgggcat agcaggacac actcttctct gggcttggct gtaggctcag 2167

aatgcaggcc cagaaccacc ctggggccta tgtaggcagc tgccgtcagc agcgtgatat 2227

atttaagtgt ctgtaaagac aaccaaagaa taaatgattt gtgtttttaa aaagnaataa 2287

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<211> 542

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<213> Mus musculus

<400> 8

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100 105 110

115 120 125

130 135 140

Arg Ser Pro Tyr Asn Tyr Leu Gln Val Ala Tyr Phe Lys Ile Asn Lys
 145 150 155 160

Leu Glu Lys Ala Val Ala Ala Ala His Thr Phe Phe Val Gly Asn Pro
 165 170 175

Glu His Met Glu Met Arg Gln Asn Leu Asp Tyr Tyr Gln Thr Met Ser
 180 185 190

Gly Val Lys Glu Ala Asp Phe Arg Asp Leu Glu Ala Lys Pro His Met
 195 200 205

His Glu Phe Arg Leu Gly Val Arg Leu Tyr Ser Glu Glu Lys Pro Gln
 210 215 220

Glu Ala Val Pro His Leu Glu Ala Ala Leu Gln Glu Tyr Phe Val Ala
 225 230 235 240

Asp Glu Glu Cys Arg Ala Leu Cys Glu Gly Pro Tyr Asp Tyr Asp Gly
 245 250 255

Tyr Asn Tyr Leu Asp Tyr Ser Ala Asp Leu Phe Gln Ala Ile Thr Asp
 260 265 270

His Tyr Val Gln Val Leu Asn Cys Lys Gln Asn Cys Val Thr Glu Leu

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285

Ala Ser His Pro Ser Arg Glu Lys Pro Phe Glu Asp Phe Leu Pro Ser

290

295

300

His Tyr Asn Tyr Leu Gln Phe Ala Tyr Tyr Asn Ile Gly Asn Tyr Thr

305

310

315

320

Gln Ala Ile Glu Cys Ala Lys Thr Tyr Leu Leu Phe Phe Pro Asn Asp

325

330

335

Glu Val Met His Gln Asn Leu Ala Tyr Tyr Thr Ala Met Leu Gly Glu

340

345

350

Glu Glu Ala Ser Ser Ile Ser Pro Arg Glu Asn Ala Glu Glu Tyr Arg

355

360

365

Arg Pro Asn Leu Leu Glu Lys Glu Leu Leu Phe Phe Ala Tyr Asp Ile

370

375

380

Phe Gly Ile Pro Phe Val Asp Pro Asp Ser Trp Thr Pro Glu Glu Val

385

390

395

400

Ile Pro Lys Arg Leu Gln Glu Lys Gln Lys Ser Glu Arg Glu Thr Ala

405

410

415

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Val Arg Ile Ser Gln Glu Ile Gly Asn Leu Met Lys Glu Ile Glu Thr

420

425

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Leu Val Glu Glu Lys Thr Lys Glu Ser Leu Asp Val Ser Arg Leu Thr

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445

Arg Glu Gly Gly Pro Leu Leu Tyr Glu Gly Ile Ser Leu Thr Met Asn

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460

Ser Lys Val Leu Asn Gly Ser Gln Arg Val Val Met Asp Gly Val Ile

465

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480

Ser Asp Asp Glu Cys Gln Glu Leu Gln Arg Leu Thr Asn Ala Ala Ala

485

490

495

Thr Ser Gly Asp Gly Tyr Arg Gly Gln Thr Ser Pro His Thr Pro Asn

500

505

510

Glu Lys Phe Tyr Gly Val Thr Val Leu Lys Ala Leu Lys Leu Gly Gln

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Glu Gly Lys Val Pro Leu Gln Ser Ala Arg Thr Ala Leu Gln

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Synthesized Primer Sequence

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<212> DNA

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Synthesized Primer Sequence

<400> 10

ccaagcttgg ctgtgtaata a

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<210> 11

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Synthesized Primer Sequence

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tcattacatc caggtcctc

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<210> 12

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<213> Artificial Sequence

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<213> Artificial Sequence

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